Қазақстан Республикасының Білім және ғылым министрлігі
С. Торайғыров атындағы Павлодар мемлекеттік университеті

АҒЫЛШЫН ТІЛІ

Сәулет және құрылыс мамандықтары бойынша мәтіндерді
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Павлодар
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Павлодар
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С. Торайғыров атындағы Павлодар мемлекеттік университетінің филология, журналистика және онер оку - әдістемелік кенесімен басуға ұсынылды

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А23 Ағылшын тілі: сәулет және құрылыс мамандықтары бойынша мәтіндерді оқуға арналған оқу – әдістемелік құралы / құраст. А. С. Сарсенбаева. – Павлодар : Кереку, 2011. – 50 б.

Оқу – әдістемелік құралында «Агылшын тілі» пәні бойынша сәулет және құрылыс мамандықтары бойынша мәтіндерді оқуға мемлекеттік тілде окитын студенттерге арналған мәтіндер, пікірлер, жұмысты жазудың максаты, тақырыптың нұскаулары берілген.

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Материалдық дурыс болуына, грамматикалық және орфографиялық қателерге авторлар мен құрастырушылар жауапты

Алғы сөз

Еліміз тәуелсіздік алып, егеменді ел болып, қазақ тілі Қазақстан Республикасының мемлекеттік тілі болып жарияланды. Заман талабына сай казіргі таңда мелекеттік тілде окитын жоғары оқу орындарының студенттеріне арналған сапалы оқу – әдістемелік құралдар мен оқулықтарды шығаруға баса көңіл бөлінуде.

Ұсынылып отырған оқу – әдістемелік құралы «Ағылшын тілі: сәулет және құрылыс мамандықтары бойынша мәтіндерді оқуға арналған» мемлекеттік тілде жоғары оқу орындарында окитын студенттерге арналған. Оқу – әдістемелік құралы тілдік емес жоғары оқу орындарындағы шетел тілінің бағдарлама талаптарына сай жасалған.

Оқу – әдістемелік құралы 13 сабақтан тұрады. Негізгі мәтіндер соң жаттығулар берілген. Олар аудиторияда орындауға арналған.

1 The art of architecture

1.1 Warming – up

1 Why did you make up your mind to become an architect?

2 Did anybody advice you to choose a career?

3 What can you say about the role of an architect in civilized society?

4 What do you think the word "architecture" means?

5 What famous architects do you know?

1.2 Read the text. Tell about the main functions of architecture

The art of architecture

Architecture is the art and the technique of building, employed to fulfill the practical and expressive requirements of civilized people. Almost every settled society that possesses the techniques for building produces architecture. It is necessary in all but the simplest cultures; without it, man is confined to a primitive struggle with the elements; with it, he has not only a defense against the natural environment but also the benefits of a human environment, a prerequisite for and a symbol of the development of civilized institutions.

The characteristics that distinguish a work of architecture from other man-made structures are (1) the suitability of the work to use by human beings in general and the adaptability of it to particular human activities; (2) the stability and permanence of the work's construction; and (3) the communication of experience and ideas through its form.

All these condition must be met in architecture. The second is a constant, while the first and the third vary in relative importance according to the social function of building. If the function is chiefly utilitarian, as in a factory, communication is of less importance. If the function is chiefly expressive, as in a monumental tomb, utility is a minor concern. In some buildings such as churches and city halls, utility and communication may be of equal importance.

1.3 Do the following statements agree with the information given in the text. Write TRUE or FALSE

1 Architecture should fulfill requirements of primitive people.

2 Without architecture, man is confined to a primitive struggle with the elements.

3 Structures should be built according to aesthetic and functional criteria.

4 There are no differences between a work of architecture and other man-made structures.

5 The stability and performance of the work's construction is a constant for all types of buildings.

6 In a factory, utility and communication are of equal importance.

1.4 Complete the sentences

1 Almost every settled society that possesses the techniques for building produces ...

A) nature;
B) architecture;
C) struggle.

2 It is necessary in all but the simplest ...

A) theories;
B) works;
C) cultures.

3 With architecture, man has a prerequisite for the development of civilized...

A) importance;
B) institutions;
C) symbols.

4 The stability and performance of the work's construction is a/an ...

A) idea;
B) form;
C) constant.

5 If the function is chiefly utilitarian, communication is of less ...

A) importance;
B) condition;
C) benefit.

6 In a monumental tomb, utility is a minor ...

A) feature;
B) concern;
C) experience.

7 Utility and communication are equally important in churches and ...

A) markets;
B) plants;
C) city halls.

1.5 There are some types of architecture. Give the examples of each type:

- Governmental architecture;
- Architecture of welfare and education;
- Domestic architecture;
- Religious architecture;
- Commercial and Industrial architecture;
- Recreational architecture.

1.6 Here you see some words. Tell to which type of architecture they refer and then make up the sentences of your own with the words in the box: theaters, hospitals, capitols, schools, stores, prisons, parliament buildings, museums, court houses, villas, circuses, athletic facilities, factories, huts, banks, exhibition halls, mines, churches, libraries, apartment houses, markets, publishing houses, mansions, post-offices, laboratories.

1.7 Further reading: Read the article «Government architecture» from the New York Times in the section Supplementary texts and tell about the main topic of the article.

1.8 Discussion:

A) Why is the history of architecture concerned more with religious buildings than with any other type?

B) Which type of architecture dominates in your country (city)? Give examples.

C) Do you predict the development of any other types? What forecasts are there for that?

1.9 Write the essay on the topic: "I've chosen architecture as a career because ..." Highlight at least 5 points which make professions so attractive.

2 The Pritzker Architecture Prize

2.1 Read the text and answer the questions

A) When was The Pritzker Architecture Prize established?
B) How often is this award given?
C) What does the award include?
D) What award does the The Pritzker Prize take after?
E) How is the ceremony location usually chosen?
F) What does the ceremony normally consists of?
G) What is written on the bronze medallion?
H) What criteria does the Jury not take into consideration?
I) When is The Pritzker's winner announced?

The Pritzker Architecture Prize is the international prize, which is awarded each year to a living architect for significant achievement. It was established by the Pritzker family of Chicago through their Hyatt Foundation in 1979. Often referred to as "architecture's Nobel" and "the profession's highest honor," it is granted annually.

The award consists of $100,000 (US) and a bronze medallion. The award is conferred on the laureate at a ceremony held at an architecturally significant site throughout the world.

The prize takes its name from the Pritzker family, whose international business interests are headquartered in Chicago. Their name is synonymous with Hyatt Hotels located throughout the world. The Pritzkers have long been known for their support of educational, scientific, medical, and cultural activities. Jay A. Pritzker, (1922-1999), founded the prize with his wife, Cindy. His eldest son, Thomas J. Pritzker, the current president of The Hyatt Foundation, explains, "As native Chicagoans, it's not surprising that our family was keenly aware of architecture, living in the birthplace of the skyscraper, a city filled with buildings designed by architectural legends such as Louis Sullivan, Frank Lloyd Wright, Mies van der Rohe, and many others."

He continues, "In 1967, we acquired an unfinished building which was to become the Hyatt Regency Atlanta. Its soaring atrium was wildly successful and became the signature piece of our hotels around the world. It was immediately apparent that this design had a pronounced effect on the mood of our guests and attitude of our employees. While the architecture of Chicago made us cognizant of the art of architecture, our work with designing and building hotels made us aware of the impact architecture could have on human behavior. So in 1978, when we were approached with the idea of honoring living architects, we were responsive. Mom and Dad

(Cindy and the late Jay A. Pritzker) believed that a meaningful prize would encourage and stimulate not only a greater public awareness of buildings, but also would inspire greater creativity within the architectural profession."

Many of the procedures and rewards of the Pritzker Prize are modeled after the Nobel Prize. Laureates of the Pritzker Architecture Prize receive a $100,000 grant, a formal citation certificate, and since 1987, a bronze medallion. Prior to that year, a limited edition Henry Moore sculpture was presented to each Laureate.

The official ceremony granting the award takes place every year, usually in May, at an architecturally significant site throughout the world. The choice of location of the ceremony reinforces the importance of the built environment while providing a unique setting for the ceremony. The presentation ceremonies move around the world each year, paying homage to the architecture of other eras and/or works by previous laureates of the prize. As the ceremony locations are usually chosen each year before the laureate is selected, there is no intended connection between the two.

The *invitation-only* event is attended by international guests and guests from the host country. The ceremony itself normally consists of welcoming remarks usually from a dignitary of the host country; comments from the jury chairman; the presentation of the prize by Thomas Pritzker; and an acceptance speech from the Laureate.

The laureate receives $100,000 and also a bronze medallion. The bronze medallion awarded to each Laureate of the Pritzker Architecture Prize is based on designs of Louis Sullivan, famed Chicago architect generally acknowledged as the father of the skyscraper. On one side is the name of the prize. On the reverse, three words are inscribed, "firmness, commodity and delight," recalling Roman architect Vitruvius' fundamental principles of architecture of *firmitas, utilitas, venustas.*

The prize is awarded irrespective of nationality, race, creed, or ideology. Nominations are accepted internationally from persons from diverse fields who have a knowledge of and interest in advancing great architecture.

The Executive Director actively solicits nominations from past laureates, architects, academics, critics, politicians, professionals involved in cultural endeavors, etc. and with expertise and interest in the field of architecture.

Additionally, any licensed architect may submit a nomination to the Executive Director for consideration by the jury for the Pritzker Architecture Prize. Nominations are accepted through November 1 of any given year. It is sufficient to send an e-mail to the Executive Director with

the nominee's name and contact information. Nominations that do not result in the award are automatically carried over to the following year. The Jury normally undertakes deliberations early in the calendar year and the winner is announced in the spring.

2.2 Do the following statements agree with the information given in the article? Write TRUE or FALSE

A) The Pritzker Architecture Prize is the award that consists of $100,000 (US) and a golden medallion.

B) The Pritzker Architecture Prize was founded by Jay A. Pritzker and his wife.

C) Chicago is considered to be the birthplace of the skyscraper with buildings by architectural legends as Louis Sullivan, Frank Lloyd D) Wright, Mies van der Rohe, and many others.

D) The Pritzker Prize's ceremony is unique and doesn't have any equivalents.

E) The medallion contains such words as "firmness, commodity and delight" which recall Greek architect Vitruvius' fundamental principles of architecture.

2.3 Find in the text the synonyms to the following words and phrases: set up, give, present (adj.), mark of honor, noticeable, aware, accolade, encourage, empower.

2.4 Translate the Thomas J. Pritzker's speech into Kazakh language:

"As native Chicagoans, it's not surprising that our family was keenly aware of architecture, living in the birthplace of the skyscraper, a city filled with buildings designed by architectural legends such as Louis Sullivan, Frank Lloyd Wright, Mies van der Rohe, and many others. In 1967, we acquired an unfinished building which was to become the Hyatt Regency Atlanta. Its soaring atrium was wildly successful and became the signature piece of our hotels around the world. It was immediately apparent that this design had a pronounced effect on the mood of our guests and attitude of our employees. While the architecture of Chicago made us cognizant of the art of architecture, our work with designing and building hotels made us aware of the impact architecture could have on human behavior. So in 1978, when we were approached with the idea of honoring living architects, we were responsive. Mom and Dad (Cindy and the late Jay A. Pritzker) believed that a meaningful prize would encourage and stimulate

not only a greater public awareness of buildings, but also would inspire greater creativity within the architectural profession."

2.5 Find the information about The Pritzker Prize's winners. Tell their names, when they got the prize, tell about their architecture works.

3 A world of wonders

3.1 You have probably read about the seven wonders of the ancient world, but there are many modern and man-made wonders as well:

A) Look at some of them in the Table 1 bellow;
B) Say if they were built in ancient times or modern times;
C) Match each statement (1-6) with the name of the sight (A-F)

Table 1

	Name	Location	Date of building
A	The Eiffel Tower	Paris, France	1889
B	Sydney Opera House	Sydney, Australia	1973
C	The Petronas Towers	Kuala Lumpur, Malaysia	1998
D	Itaipu Dam	Brazil and Paraguay	1991
E	Eurotunnel	Dover to Calais	1994
F	Pyramid of the Sun	Mexico	c 400 AD

1 It was built to look like a giant sailing ship. Since it opened, performances have been given here by many famous artists.

2 It has received around 9 million visitors but it was not designed as a tourist attraction. Much of the electricity and water for two countries is supplied by it.

3 It is made of 15,000 pieces of iron and it was not very well liked at first. It wasn't torn down because of its antenna, which was being used to send messages at the time.

4 Since 1994 Great Britain has been connected to Europe by this underground structure. At this very moment hundreds of passengers are being carried from London to Paris by high speed train in just three hours.

5 This magnificent stepped structure has existed in the Valley of Mexico for more than 1,500 years. It stands 64 meters high and is 640 meters square. It was built with a flat top because at the time it held a wooden temple.

6 They were the tallest buildings in the world since 1998 to 2004 until Taipei 101 was finished in 2004. Their feature is a skybridge between them on 41st and 42nd floors that, according to, Cesar Pelli, the architect who built them, "... with its supporting structure creates a portal to the sky ... a door to the infinite".

3.2 Answer the questions:

A) What countries does Eurotunnel connect?

B) What is the name of the creator of The Petronas Towers?

C) What continents are these constructions situated in?

D) How many years was The Petronas Towers the highest in the world?

E) What is the function of Itaipu Dam?

F) What is the oldest and latest of all these constructions?

3.3 Find in the text the words of the following definitions

A) somewhere or something you can visit that is interesting or enjoyable;

B) an important part or aspect of something;

C) a road, railway, or path that goes over a river, over another road etc, and the structure that supports it;

D) below the surface of the ground;

E) the act of performing a play, dance, or other form of entertainment;

F) very impressive and beautiful, good, or skilful;

G) a building used for worship in some religions, typically religions other than Christianity;

H) to make something new or original that did not exist before;

I) extremely large;

J) level and parallel to the ground, smooth on the surface, with no lumps or slopes.

3.4 Further reading: prepare the information about The Eiffel Tower, Sydney Opera House, The Petronas Towers, Itaipu Dam, Eurotunnel, Pyramid of the Sun.

4 Petra - a rose-red city half as old as time

4.1 Ask your partner what he knows about:
A) Jordan;
B) The Nabataeans;
C) Petra;
D) UNESCO.

4.2 Read the text about Petra and tell how above-mentioned words are connected

The giant red mountains and vast mausoleums of a departed race have nothing in common with modern civilization, and ask nothing of it except to be appreciated at their true value - as one of the greatest wonders ever wrought by Nature and Man. Although much has been written about Petra, nothing really prepares you for this amazing place. It has to be seen to be believed.

Petra, the world wonder, is without a doubt Jordan's most valuable treasure and greatest tourist attraction. It is a vast, unique city, carved into the sheer rock face by the Nabataeans, an industrious Arab people who settled here more than 2000 years ago, turning it into an important junction for the silk, spice and other trade routes that linked China, India and southern Arabia with Egypt, Syria, Greece and Rome.

Entrance to the city is through the Siq, a narrow gorge, over 1km in length, which is flanked on either side by soaring, 80m high cliffs. Just walking through the Siq is an experience in itself. The colours and formations of the rocks are dazzling. As you reach the end of the Siq you will catch your first glimpse of Al-Khazneh (Treasury).

This is an awe-inspiring experience. A massive façade, 30m wide and 43m high, carved out of the sheer, dusky pink rock-face and dwarfing everything around it. It was carved in the early 1st century as the tomb of an important Nabataean king and represents the engineering genius of these ancient people.

The Treasury is merely the first of the many wonders that make up Petra. You will need at least four or five days to really explore everything here. As you enter the Petra valley you will be overwhelmed by the natural beauty of this place and its outstanding architectural achievements. There are hundreds of elaborate rock-cut tombs with intricate carvings - unlike the houses, which were destroyed mostly by earthquakes, the tombs were carved to last throughout the afterlife and 500 have survived, empty but bewitching as you file past their dark openings. Here also is a massive Nabataean-built.

The best time to see Petra, especially if you're planning to take photographs, is either early to mid-morning or late afternoon, when the angled sun highlights and enhances the amazing natural colours of the rocks

4.3 Here is the last part of the reading text about Petra. Fill in each of the numbered blank with one, given in the box:

A) made;
B) rediscovered;
C) debut;
D) half-carved;
E) by;
F) antiquity;
G) pretending;
H) caravan-city;
I) designated.

Did you know?

The Nabataean city of Petra (1) _____ its Hollywood (2) _____ in 1989 in "Indiana Jones and the Last Crusade" starring Harrison Ford.

Petra is sometimes called the 'Lost City'. In spite of its being such an important city in (3) _____, after the 14th century AD, Petra was completely lost to the western world. It was (4) _____in 1812 (5) _____ the Swiss traveller, Johann Ludwig Burckhardt, who tricked his way into the fiercely guarded site by (6) _____to be an Arab from India wishing to make a sacrifice at the tomb of the Prophet Aaron.

In 1985, UNESCO (7) _____Petra as World Heritage Sites.

Inhabited since prehistoric times, this Nabataean (8) _____, situated between the Red Sea and the Dead Sea, was an important crossroads between Arabia, Egypt and Syria-Phoenicia.

Petra is half-built, (9) _____ into the rock, and is surrounded by mountains riddled with passages and gorges. It is one of the world's most famous archaeological sites, where ancient Eastern traditions blend with Hellenistic architecture.

4.4 What do the words in bold refer to in each of these extracts from the text?

A) **It** is a vast, unique city …

B) … **that** linked China, India and southern Arabia with Egypt, Syria, Greece and Rome.

C) … **which** is flanked on either side by soaring

E) … dusky pink rock-face and dwarfing everything around **it**.

4.5 You are given the words which belong to different part of speech. Complete Table 2 consulting with a dictionary

Table 2

Noun	Verb	Adjective
civilization		
	appreciate	
		amazing
attraction		
		inspiring
	represent	
	explore	
achievement		
		pretending
		inhabited

5 Swiss Re Headquarters

5.1 Read the text about the new London sightseeing. Tell if the author likes the building? Why/why not?

At just 18- metres and 40 stories, the new skyscraper officially known as 30 St.Mary Axe is less than half the height's of the world's 10 tallest buildings, and not even the tallest building in London. But it draws instant attention because of its unique shape, which has been variously compared to a cigar, a rocket, a bullet, a lipstick, a Zeppelin airship, a lava lamp, a bandaged finger, and –most frequently – a gherkin. Its architect Norman Foster, prefers the metaphor of a pine cone or pineapple, since they do more justice the building's shape.

The Gherkin has rapidly become a well-known contemporary icon and much-loved tourist attraction. Most Londoners appreciate the novelty and sophistication of the building. Some despise it for desecrating the ancient City of London; but the quaint character of the City was pretty well desecrated decades ago by uninspired postwar rebuilding. The shape is a bit frivolous-looking for a building whose original owner was Swiss Re, a sober and respectable Zurich-based insurance company. But the sparkling glass surfaces covering the entire outside (made of 5,000 triangular windows, many of which open) and calm gray walls inside the building are ultrachic and ultramodern.

The building is round in floor plan to reduce the high winds generated at street level by tall rectangular buildings. On each of the office levels (floors 2-34), six pie-shaped pieces have been cut out from the plan, with elevators and other service facilities at the center. These six open cuts allow natural daylight to penetrate far back towards the elevator core and add desirable window-facing working space.

Swiss Re is seriously concerned about the possible financial costs to its clients of such things as global warming, and was determined to make its London headquarters a model of environment- friendly, energy-saving design. Genuine fresh air from outside can be guided about and used to reduce the need for mechanical air conditioning. In the basement there are no spaces for cars, but there are racks for bicycles and showers for cyclists.

London's new symbol is a sparkling, sensuous but profoundly sensible tower.

5.2 Answer the questions

A) What's the official name of the building? What's its nickname and why?

B) What other metaphors have been used to describe it?

C) What do people in London think of it?

D) What special features does the building have?

5.3 Work with the partner. Choose one of these statements and discuss it:

A) Ultramodern building should not be built next to old buildings.

B) A company's building says a lot about the company itself.

5.4 Look at these compound adjectives from the text. What do they describe in the article and what do they mean: well-known, much-loved, frivolous- looking, Zurich-based, pie-shaped, window-facing, environment-friendly, energy-saving.

6 Gateshead Millennium Bridge

6.1 What do you think is the function of bridges? What famous bridges do you know? What do you know about them?

6.2 Read the text about Millennium Bridge and answer the questions:

A) What construction company built this bridge?
B) How does the bridge work?
C) What is LUSAS?
D) How did LUSAS contribute to the building of the bridge?
E) Give the description of the bridge?
F) What is special about the Millennium Bridge?

Gateshead Millennium Bridge is the world's first and only tilting bridge, and was designed by Gifford and Partners with Wilkinson Eyre. Made of steel and designed with the aid of LUSAS Bridge analysis software, the bridge stands 45m high and spans 105m across the River Tyne to provide a link for pedestrians and cyclists between the newly revived Newcastle quayside and the Gateshead quayside opposite.

Overview

Whilst small river craft can sail beneath the bridge, for larger craft the cable-stayed double arched structure pivots at the abutments through an angle of 40 degrees to give the 25m navigational clearance as specified by the client, Gateshead Borough Council. Powered by eight electric motors, it takes approximately four minutes to rotate the 850 tonne dead weight of the structure to its fully open position. When raised the suspension cables lay horizontal holding the pair of arches together. Huge 14 tonne castings on either side support bearings which withstand the outward and radial thrusts imposed.

The130m long bridge deck is parabolic in elevation and of steel box section that tapers in plan towards the centre of the deck. It carries a pedestrian footway that varies from 3m to 5m in width as well as a 2.5m cantilevered cycleway. The main arch is also parabolic in shape and tapers both in plan and elevation.

Modelling

To model the structure in LUSAS two-noded 3D bar elements, 3D engineering thick beams, and corresponding 3D joint elements were used. Detailed analyses carried out included: linear static, frequency (eigenvalue)

extraction, buckling (eigenvalue) analysis, and staged construction using a nonlinear analysis with a linear elastic material. Staged construction facilities in LUSAS allow a complete model to be built letting users activate or deactivate selected elements to suit the stage of construction being considered. It is particularly suited to cable stayed structures of this type where prestressing of the cables using initial stress or strain, and replacement or severance of cable stays is to be investigated.

Shapour Mehrkar-Asl, one of the engineers on the project said, "The forces and displacements produced from the LUSAS analyses were used to decide upon the design and staged construction method". He continued, "The calculation of the initial forces in the tendons to give the required profile for the bridge deck, allowing for any camber, were used in the staged construction analysis, and were an essential part in the design of the bridge."

Staged construction analyses were also carried out to investigate the lifting and transporting of the bridge from the construction yard, to its permanent position. Elements representing the lifting assembly can be seen on the LUSAS model shown.

Dead, live, wind loading, and temperature effects were also assessed, with rigid supports being used for all models with the exception of the opening and closing model which required spring supports with contact gap elements.

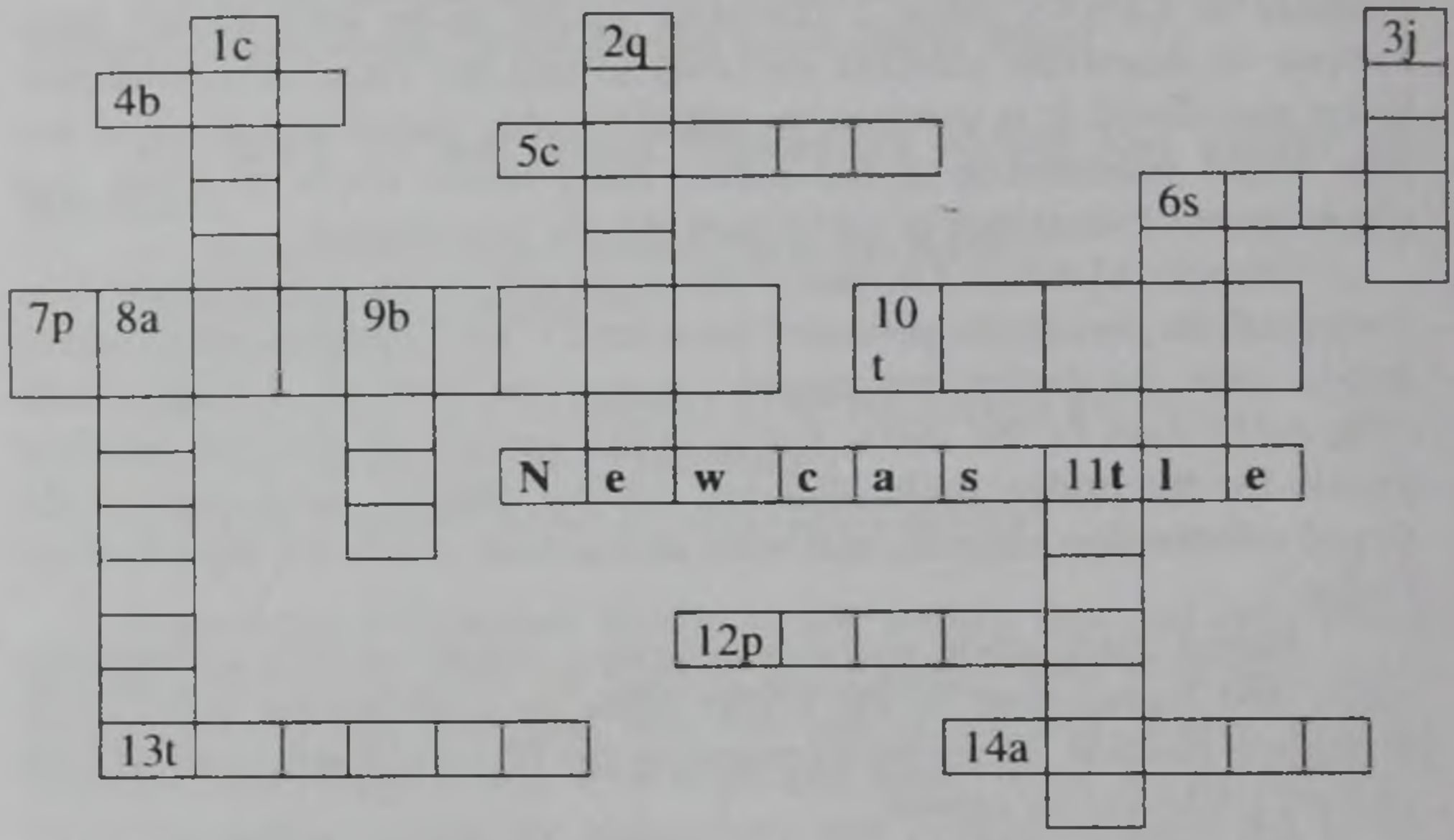
Dynamic analysis

A dynamic analysis of the opening and closing sequence using step-by-step integration was also carried out. For this analysis, elements were amended to allow for a 40 degree rotation of the whole model with contact joint elements being used to allow for support separation. In addition, the 3D engineering thick beam elements were replaced with nonlinear 3D engineering thick beams to accommodate the rotation in the model.

According to Shapour Mehrkar-Asl, "Using LUSAS was essential on the design of this bridge because a full 3D staged construction analysis to model the construction sequence, and a step-by-step integration with large angles, to model the opening and closing sequence was required".

The fully assembled bridge was lifted into place by the Asian Hercules II, one of the world's largest floating cranes and officially opened in May 2002. Its construction won the architects Wilkinson Eyre the 2002 Royal Institute of British Architects (RIBA) Stirling Prize and won Gifford the 2003 Institution of Structural Engineers Supreme Award.

6.3 You are given the crossword. All words are taken from the text. Do the crossword



ACROSS

4) a long narrow piece of metal;

5) strong thick metal rope;

6) to include the whole of an area;

7) something in a shape of a *parabola;*

10) gradually become narrower towards one end;

12) to turn or balance on a central point, or to make something do this;

13) a reinforcing strand in prestressed concrete;

14) the shape that is made where two straight lines join or cross each other.

DOWN

1) a gradual curved slope from the centre of a road down to its sides;

2) the area around a quay or at the edge of it;

3) a place where two parts of something are connected;

6) a strong metal made from a mixture of iron and carbon;

8) a masonry mass supporting and receiving the thrust of part of an arch or vault;

9) a long thick piece of wood, metal, or concrete that supports a roof;

11) sloping.

6.4 Further reading:

A) Find information about such bridges as the Brooklyn Bridge, the Golden Gate Bridge, the Sydney Harbour Bridge, the Le Pont de Normandie, the London bridge, the Millau Bridge, The Akashi-Kaikyo Bridge and complete Table 3:

Table 3

	Location	Architects	Date Completed	Height	Length
The Brooklyn Bridge					
The Golden Gate Bridge					
the Sydney Harbour Bridge					
The Le Pont de Normandie					
The London bridge					
the Millau Bridge					
The Akashi-Kaikyo Bridge					

B) Use Degrees of Comparison and compare these bridges

7 The Eden Project

7.1 Read the text about the Eden Project and what this project is

The Eden Project: Our story

A The Eden Project was constructed in a 160-year-old exhausted china clay quarry at Bodelva, near St. Austell, in Cornwall. It was

established as one of the Landmark Millennium Projects to mark the year 2000 in the UK.

While restoring the Lost Gardens of Heligan in the early '90s, Tim Smit became fascinated with stories that connected plants to people and brought them alive. He enlisted the help of Philip McMillan Browse (former Director of RHS Wisley and Horticultural Director of the Lost Gardens of Heligan) and Peter Thoday (former President of the Institute of Horticulture), to put together a team of expert horticulturalists.

B In the first two months of construction it rained every day; 43 million gallons of rainwater drained into the pit. This prompted the engineers to come up with a magnificent subterranean drainage system that now collects all the water coming on to the site.

We use it to irrigate our plants and flush our loos, while rainwater that falls on the Biomes is used to maintain the humidity inside the Rainforest Biome. Today almost half of our water needs are provided from water harvested on site.

C You could fit the Tower of London in the Rainforest Biome. The Guinness Book of Records heralds the Biomes as the biggest conservatories in the world. Building these 'lean-to greenhouses' on an uneven surface that changed shape was tricky: 'bubbles' were used because they can settle on any shaped surface – the architect got the idea while washing up!

D With help from Reading University we made over 83,000 tonnes of soil, because we didn't want to deprive anyone else of theirs and because we wanted to get the recipes right.

The mineral component came from local mine wastes: sand from IMERYS china clay works and clay from WBB Devon Clays Ltd. In the Biomes, composted bark provided the organic matter component because it needed to be long lived.

The rapid growers in the Rainforest Biome needed a rich organic soil capable of holding lots of water and nutrients while the slower growers in the drier Mediterranean Biome used a sandy mix which held less of both. A specialist nutrient-free mix was used in the South African Fynbos, where fertile soil is toxic to some of the plants.

Outdoors, we went for composted domestic green wastes. The ingredients were mixed with a JCB in a nearby clay pit, and Wiggly Wigglers worms helped dig and fertilise the new earth. Our soils help to show that environmental regeneration is possible.

E The covered Biome climates are constantly monitored and are controlled automatically. In the Rainforest Biome automated misters moisten the air (90% relative humidity at night, and down to 60% in the

day) and ground-level pipes irrigate the soil so you don't have to put up with the rainforest's 1,500 mm (60 inches) of rain a year. Our huge waterfall uses recycled water and keeps humidity high. In the Mediterranean we keep it drier. Vents are often open, even during cool periods, to reduce humidity and therefore fungal problems. The main heating source for both Biomes is the sun. The back wall acts as a heat bank, releasing warmth at night. The two layers of air in the triple-glazed windows provide insulation. Extra heating comes from the big grey air-handling units which also help circulate the air on hot days.

F We've planted around 1 million plants of just under 4,000 taxa (species and cultivars). Most are not rare, except for the few that tell stories of the need for conservation, neither were they taken from the wild. Many were grown from seed in our nursery, others came from botanic gardens, research stations and supporters, mostly in Europe and the UK. Once established, the big 'uns in the Rainforest Biome are pruned by abseilers or from a cherry picker. Our green team are 'extreme gardeners'; planting on near-vertical banks presents something of a challenge.

G Some of our plants are insect-pollinated, others wind-pollinated. In an emergency we use a paintbrush! We only have to pollinate the flowers if we want them to produce seeds. Our rigorous healthcare programme, using isolation houses at Eden's nursery, catches pest and disease problems before they reach the pit. In the pit our integrated pest management system uses cultural methods (removal of infested plant parts), 'soft' chemicals (soaps and oils) and 33 different types of biological control (bugs that eat bugs). We give some of them a lift up to the canopy in the Rainforest Biome in little bamboo pots on string pulley systems.

We also have some birds and lizards in the Biomes which not only look good but also eat their fill of pests. UV lightboxes catch pests and monitor their numbers so we can keep an eye on everything.

7.2 Choose the correct headings for parts A-G of the texts: from the beginning, soil, animals, climate, let it rain, a bit about the biomes, plants.

7.3 Answer the questions:

A) Where is the Eden project?
B) What people contributed to the Eden project construction?
C) What is the function of the drainage system?
D) How are the rapid growers and the slower growers different?
E) Is the climate the same in all biomes?
F) How do the Eden's workers pollinate flowers?

7.4 Discussion:

In the text there is a sentence "He enlisted the help of Philip McMillan Browse (former Director of RHS Wisley and Horticultural Director of the Lost Gardens of Heligan) and Peter Thoday (former President of the Institute of Horticulture), to put together a team of expert horticulturalists."

A) Give the Kazakh equivalent (or explanation) to the words: horticultural, horticulturalists, horticulture.

B) What does a horticulturalist deal with?

C) Are there any horticulturalists in your country?

7.5 In the text there are two sentences with exclamation mark (!). Why do you think the author use it?

A) Building these 'lean-to greenhouses' on an uneven surface that changed shape was tricky: 'bubbles' were used because they can settle on any shaped surface – the architect got the idea while washing up!

B) In an emergency we use a paintbrush!

8 The London Eye

8.1 Ask your partner what he knows about the modern architectural places of interest in the UK and the London Eye.

8.2 Ask your partner if he knows why such name was given to this place of interest

8.3 Now read the text about the London Eye and choose from the words and phrases (A-I) the one which fits each gap (1-8). There is an example at the beginning (0)

A dwarfs;
B distance;
C rim;
D observation wheel;
E hub;
F overhanging;
G cables;
H lit;
I exceptional safety standards.

The beautiful and striking 'Eye" has already become a symbol of London. It spectacularly fulfils its purpose of giving visitors and city dwellers a bird's-eye view over the city and beyond for the first time ever. Within six months of opening this Millenium Project had attracted its million visitor.

The 'Eye' is the world's biggest (0) observation wheel, and the largest object ever lifted from the horizontal to the vertical. Ideally positioned in the center of the city above the Thames, it 1 _____ its near neighbors, Big Ben and the Houses of Parliament, on the opposite bank, and County Hall, on the south bank. To minimize its ground-level impact its supports touch the ground at only three points- in a narrow 30 meter wide strip alongside County Hall. To keep the riverside promenade clear, passengers board the Eye from a platform 2 _____ the river.

From a 3 _____, it looks like a bicycle wheel, but close up, it is a stunning technically advanced structure. Its 4_____ is the largest-ever steel casting, and its cable 'spokes' are so thin, that, if the structure were scaled down to bicycle size, they would be barely visible. It is an astonishing engineering feat that these stressed 5 _____, with little inherent stiffness, hold the giant 6 _____, 424 meters in circumference and weighing 1,750 tones, to the hub.

To give passengers unimpeded views, the 32 passengers capsules, each holding 25 passengers, are fitted to the outside of the wheel rim. They are aerodynamic, rugby ball-shaped with enclosing ultraclear glass walls. Beneath the floor are air-conditioning units and 'logic controllers' that maintain the capsule's horizontal position, turning it in the opposite direction to the wheel rim and ensuring a smooth, steady ride. The night ride, with the capsule 7 _____ by blue and white ceiling lights, is enchanting.

Built to 8 _____, and with wheelchair access, it is the biggest visitor attraction in the UK and the second biggest (after Euro Disney) in Europe.

8.4 Do the following statements agree with the information given in the article. Write TRUE, FALSE or NOT GIVEN

1. The London Eye is the biggest visitor attraction in the world.
2. The London Eye capsule has a soccer ball-shape with enclosing ultraclear glass walls.
3. There is a special platform overhanging the river that helps passengers to board the Eye.
4. Ideal position helps the London Eye to dwarf Big Ben.

5. Each capsule represents one of the London Boroughs.

8.5 Read the article quickly to find what these numbers refer to:
30; 424; 1,750; 32; 25.

8.6 Further reading: prepare the information about Big Ben, the House of Parliament, County Hall, Euro Disney, Mark Barfield Architects.

9 Norman Foster

9.1 Read the review from the Financial Times on "Norman Foster: A Life in Architecture" by Deyan Sudjic and answer the questions given after the article

It's hard to believe that only 20 years ago Norman Foster felt unappreciated in his adopted home city of London. Along with his one-time partner Richard Rogers, he had reimagined modernism as a high-tech, sci-fi utopia, a future of vast airports and crystalline offices conceived transparently as machines for making money. He had already completed the self-proclaimed most expensive building in the world, the Hong Kong headquarters of banking giant HSBC, but he was struggling to find more work.

Today, from a vantage point on his now non-wobbly Millennium Bridge above the Thames, Foster is impossible to avoid. Swiss Re's "Gherkin" redefined the skyscraper for a new millennium as an organic, frankly phallic gesture, while his Willis HQ wraps around the City's clustered towers. On the South Bank, City Hall, HQ of the Greater London Authority, has rolled to a stop by the glass cliffs of his huge More London development. If you were standing in the Gherkin's attenuated glass dome you could look down on the undulating roof of the Great Court of the British Museum, the redesigned triumphal piazza of Trafalgar Square and glimpse, on the horizon to the west, the tilting white arch of the new Wembley Stadium. No architect since Sir Christopher Wren has exerted this kind of influence.

London, though, is just an outpost of Foster's glassy empire. There's Beijing's new airport terminal, the biggest building in the world; the Millau Viaduct in France, the tallest bridge in the world; and Berlin's Reichstag, perhaps the most historically charged building in the world. So how did Lord Foster of Thames Bank become the richest and most successful architect in the world? Deyan Sudjic himself does not seem entirely certain. Instead he faithfully plots Foster's trajectory from the dingy backstreets of

Manchester to Yale, from a front-room office in Hampstead to the drawings factory in Battersea from which Foster took his noble title.

In many ways the diametric opposite of Britain's other architect lord, Richard Rogers, with his background of cosmopolitan privilege, Foster came up the hard way. Rogers is political, using his position to attempt to influence legislation; his office canteen became the River Café, the home of champagne socialism, and his company introduced a famously fair profit distribution system. In contrast, Foster is ruthlessly apolitical and his office is notorious for its 24-hour shifts. He became hugely wealthy when he sold a share in the practice to private equity company 3i and is now a tax exile in Switzerland – a fact that Sudjic, Foster's long-time friend, politely omits.

Authorised and mildly hagiographic, this biography shows Foster as he would like to be seen – driven, pushing himself and his staff to be the best, international, competitive and sleekly functional. He is looking beyond the building to build at a city scale: Masdar in Abu Dhabi is taking shape as the world's first zero-carbon metropolis. Here is an architect who, according to Sudjic, still feeds off his early infatuation with Dan Dare and the fantasies of future worlds, who pilots himself and designs superyachts.

A less kind interpretation would be that Foster's work is simply about being bigger, taller, newer, more slender, more transparent. Nearly every one of his most famous buildings eschews its context: think of the Gherkin or Wembley or the GLA. These are buildings that stand apart, that fail to communicate with their neighbours; they are self-sufficient and they stand alone. Sure, this is an architect who aspires to design at the city scale but not to design in cities, with their messy complexity and surprising juxtapositions of texture and time; instead to conceive entirely new cities, sci-fi utopias, Foster-worlds.

His best buildings are airports, themselves metropolises manqués, places where history and context are erased and everything hinges on the next flight, the future, the destination, on getting somewhere else. It is no surprise that Foster is building the world's first spaceport, in the New Mexico desert. Sudjic glosses over (although doesn't entirely ignore) Foster's ghastliest works, at the zenith of which is the Pyramid of Peace in Kazakhstan.

But that cynical version wouldn't quite be the truth either. Foster at his best is superb. His exquisite Carré d'Art in Nîmes stands up well beside that most demanding of neighbours, a Roman temple; Stansted Airport suggested an ethereal alternative to the dim boxes that airports had become; his own offices are perhaps the only beautiful buildings along the sorry sight of the modern Thames. Canary Wharf Underground Station and

Bilbao's metro system transform daily life in the city with Foster's characteristic blend of elegance and efficiency.

There are no great revelations here, no major insights. Foster emerges as cool, shrewd and clever. He is consistently voted the architect most admired by other architects. I suspect that is less because they want to design like him and more because they want to live like him.

This book will tell you how to do neither, but it is an extraordinary story of a truly self-made man who seems a kickback to the great Victorians, the engineers and industrialists who made the Manchester he came from and conquered the world with their machines.

By Edwin Heathcote

9.2 Answer the questions:

A) What is Norman Foster?

B) What works has Norman Foster created?

C) Why does the author say "No architect since Sir Christopher Wren has exerted this kind of influence"?

D) How did Norman Foster become the most successful architect in the world?

E) What noble title does he have?

F) What is the difference between Richard Rogers and Norman Foster?

G) How can you describe Norman Foster?

H) How can you describe his works?

9.3 Find adjectives in the article which mean:

A) legally made a part of a family that is not your original family;

B) consisting of crystals or looking like crystals, very transparent and bright;

C) celebrating a triumph, or showing a feeling of triumph;

D) not interested in politics or political issues;

E) famous for something bad;

F) simple, clear, and easy to understand;

G) able to provide everything that you need by yourself, without help from other people;

H) shocking in a way that frightens or upsets you;

I) … sounds, qualities etc have a delicate beauty that makes them seem not to be part of the real world.

9.4 Further reading: Find the answers to the following questions

A) Where and when was Norman Foster born?

B) What is "Team 4"?
C) What awards does Norman Foster have?
D) When was Norman Foster knighted?

9.5 Prepare a short report on either "Foster worlds" or "Foster and Kazakhstan" topics

10 From the History of Building

10.1 Read and translate the text

Many thousands of years ago there were no houses such as people live in today. In hot countries people sometimes made their homes in the trees and used leaves to protect themselves from rain or sun. In colder countries they dwelt in caves. Later people left their caves and trees and began to build houses out of different materials such as mud, wood or stones.

Later people found that bricks made of mud and dried in the hot sunshine became almost as hard as stones. In ancient Egypt especially, people learned to use these sun-dried mud bricks. Some of their buildings are still standing after several thousands of years.

The ancient Egyptians discovered how to cut stone for building purposes. They erected temples, palaces and huge tombs. The greatest tomb is the stone pyramid of Khuful, king of Egypt. The ancient Egyptians often erected their huge constructions to conmemorate their kings or pharaons.

The ancient Greeks also understood the art of building with cut stone, and their buildings were beautiful as well as useful. They often used pillars, partly for supporting the roofs and partly for decoration. Parts of these ancient buildings can still be seen today in Greece.

Whereas the ancient Greeks tried to embody the idea of harmony and pure beauty in their buildings, the Roman architecture produces the impression of greatness, might, and practicalness.

The Romans were great bridge, harbour and road builders. In road works the Romans widely used timber piles. They also erected aqueducts, reservoirs, water tanks, etc. Some of their constructions are used till now. It is known that the manufacture of lime is one of the boldest industries used by man. Lime is a basic building material all over the world as today so in the ancient world. Marcus Porcius Cato gave an idea of a kiln for lime, production: it's shape and dimensions. They are rough cylindrical or rectangular structures, built of stone in a hillside with an arched caning at the front to enable the fire to be made and the lime to be withdrawn. Such kilns were fired with wood or coal and were extremely inefficient. There

are still many remains of kilns in some places of Great Britain as well as roads and the famous Hadrian's wall, which was erected to protect the Romans from the celtic tribes in the first century A.D. Britain was a province of the Roman Empire for about four centuries. There are many things today in Britain to remind the people of the Romans: towns, roads, wells and the words.

By the way, Hadrian, the Roman emperor, was also the one who suggested the absolutely new for that time idea of building the Pantheon with a dome. He constructed it, and alongside with a number of other outstanding buildings such as the Colosseum and the Baths of Caracalla, it is still there in Rome. Many ancient buildings in Rome were designed by Hadrian as well as by other Roman emperors.

In a period of 800 to 900 years the Romans developed concrete to the position of the main structural material in the empire.

Fusion of Roman and North European traditions in construction was reflected in many ways. Buildings combined the Roman arch and the steep peaked roof of Northern Europe. Roman traditions were continued in the architectural form known as Romanesque. London Bridge, finished in 1209, took thirty-three years to build. It consisted of nineteen irregular pointed arches with its piers resting on broad foundation, which was designed to withstand the Thames current.

The Romanian period was followed by other periods each of which produced its own type of architecture and building materials. During the last hundred years many new methods of building have been discovered. One of the most recent discoveries is the usefulness of steel as a building material.

Nowadays when it is necessary to have a very tall building, the frame of it is first built in steel and then the building is completed in concrete. Concrete is an artificial kind of stone, much cheaper than brick or natural stone and much stronger than they are. The earliest findings of concrete building fragments belonging to prehistoric times were discovered in Mexico and Peru. The Egyptians in the construction of bridges, roads and town walls employed it. There are evidences that ancient Greeks also used concrete in the building purposes.

The use of concrete by the ancient Romans can be traced back as far as 500 B.C. They were the first to use it throughout the ancient Roman Empire On a pretty large scale and many constructions made of concrete remain till nowadays thus proving the long life of buildings made of concrete. Of course, it was not the concrete people use today. It consisted of mud, clay and pure lime, which were used to hold together the roughly broken stone in foundations and walls. It was the so-called "pseudo

concrete". The idea of such building material might have been borrowed from the ancient Greeks as some samples of it were found in the ruins of Pompeii.

10.2 Explain in English the meaning of the following words:

Sun-dried mud bricks, timber piles, pseudo concrete, the ruins of Pompeii, harmony and pure beauty.

10.3 Read the text one more time. Do the following statements agree with claims of the writer of the passage? Write TRUE, FALSE or NOT GIVEN

A) In colder countries people lived in a large hole in the side of a hill or under the ground;

B) The ancient Greeks erected temples and huge tombs to commemorate their kings;

C) Lime was a main building material all over the world;

D) Marcus Porcius Cato was a Roman statesman, commonly surnamed the Censor or the Wise;

E) Such things as castles and bridges remind the people of the Romans.

10.4 Further reading: Find information about the history of building in Asian countries

11 Civil Engineering

11.1 Read and translate the text

The term "engineering" is a modern one. The New Marriam-Webster Dictionary gives the explanation of the word "engineering" as the practical application of scientific and mathematical principles.

Nowadays the term "engineering" means, as a rule, the art of designing, constructing, or using engines. But this word is now applied in a more extended sense. It is applied also to the art of executing such works as the objects of civil and military architecture, in which engines or other mechanical appliances are used. Engineering is divided into many branches. The most important of them are: civil, mechanical, electrical, nuclear, mining, military, marine, and sanitary engineering.

While the definition "civil engineering " dates back only two centuries, the profession of civil engineer is as old as civilized life. It started developing with the rise of ancient Rome. In order to understand

clearly what civil engineering constitutes nowadays, let us consider briefly the development of different branches of engineering.

Some form of building and utilization of the materials and forces of nature have always been necessary for the people from the prehistoric times. The people had to protect themselves against the elements and sustain themselves in the conflict with nature.

First the word "civil engineering" was used to distinguish the work of the engineer with a non-military purpose from that of a military engineer. And up to about the middle of the 18th century there were two main branches of engineering — civil and military. The former included all those branches of the constructive.art not directly connected with military operations and the constructions of fortifications, while the latter, military engineering, concerned itself with the applications of science and the utilization of building materials in the art of war.

But as time went on, the art of civil engineering was enriched with new achievements of science. With the beginning of the Industrial Revolution and later there came a remarkable series of mechanical inventions, great discoveries in electrical science and atomic energy. It led to differentiation of mechanical, electrical, nuclear engineering, etc.

It is a well-known fact that with the invention of the steam engine and the growth of factories a number of civil engineers became interested in the practical application of the science of mechanics and thermodynamics to the design of machines. They separated themselves from civil engineering, and were called "mechanical engineers".

With the development of the science of electricity, there appeared another branch of the engineering — electrical engineering. It is devided now into two main branches: communications engineering and power engineering.

In the middle of the 20lh century there appeared some other new branches of engineering — nuclear engineering and space engineering. The former is based on atomic physics, the latter — on the achievements of modern science and engineering.

At present there are hundreds of subdivisions of engineering, but they all, at one time or another, branched off from civil engineering.

The term "civil engineering" has two distinct meanings. In the widest and oldest sense it includes all non-military branches of engineering as it did two centuries ago. But in its narrower, and at the present day more correct sense, civil engineering includes mechanical engineering, electrical engineering, metallurgical, and mining engineering.

Here are some fields of civil engineering:

1 Housing, industrial, and agricultural construction;

2 Structural engineering comprises the construction of all fixed structures with their foundations;

3 The construction of highways and city streets and pavements;

4 The construction of railroads;

5 The construction of harbours and canals;

6 Hydraulic engineering which includes the construction of dams and power plants.

11.2 Read the text one more time and answer the questions:

A) What does the word "engineering" mean?
B) Is engineering a science?
C) Into what branches is Civil engineering divided?
D) How old is the profession of a civil engineer?
E) What distinct meanings does the term "civil engineering" have?
F) What fields of Civil engineering do you know?
G) What are the most important branches of Civil engineering?
H) What invention laid the foundation for mechanical engineers?
I) When was electrical engineering developed?
J) What are the main subdivisions of the electrical engineering?

11.3 Draw the diagram showing the development of civil engineering

11.4 Translate the extract into Kazakh language

The term "civil engineering" is usually applied to such activities as the excavation and then the construction of different buildings, bridges, roads, docks, harbours and embankments as well as to the water control by dams and reservoirs, canals and aqueducts, pipelines and the reclamation of land.

What does the international word "reclamation" mean here? Explain it in the most detailed way in Kazakh.

12 Some building professions

12.1 Read and translate the text

Some Building Professions

A man, who has been an apprentice for some years in a building trade and has therefore enough skill to be considered a skilled worker at his trade, is called tradesman or craftsman. He may be a carpenter-and-joiner,

bricklayer, mason, slaterand-tiler, plumber, electrician, house painter, glazier, floor-and wall tiler, plasterer, paper-hanger, steeplejack, hot water fitter and so on.

Bricklayer is a tradesman who builds and repairs brickwork, lays and joints salt glazed stoneware drains, sets, chimney pots, manhole frames and fireplaces. He renders brickwork, including the insides of manholes. A sewer and tunnel bricklayer is a specialized bricklayer.

In some districts of Greart Britain, bricklayers also fix wall and flooring tiles and slating and lay plaster and granolithic floors. But elsewhere these are plasterer's specialities.

Carpenter is a man who erects wood frames, fits joints, fixes wood floors, stairs and window frames, asbestos sheeting and other wallboard. He builds or dismantles wood or metal formwork. The two trades of carpenter and joiner were originally the same, and most men can do both, but specialize in one or the other. In the USA the term "carpenter" includes a joiner. The word is derived from the French word charpente, which means a wood or metal framework.

Joiner is a man who makes joinery and works mainly at the bench on wood, which has been cut and shaped by the machinists. His work is finer than the carpenter's, much of it being highly finished and done in a joinery shop which is not exposed to weather. In Scotland a joiner is a carpenter-and-joiner.

Mason is a stone worker or stone setter. In Scotland and the USA a bricklayer is usually also a mason. A fixer or a fixer mason or a builder mason is a mason who sets prepared stones in walls, whether the stone be only facing or to the full wall thickness.

Plasterer is a tradesman who may be a fibrous plasterer or a plasterer in solid work. The latter lays successive coats of plaster or rendering and fixes fibrous plaster such as mould cornices and wall pattern. He can use a horsed mould, erect lathing for plaster, and apply stucco5.

A construction manager, or CM, provides services similar to those of general constractor, but represents client's interest during all phases of the building process — design as well as construction. They are usually paid a negotiated fee for the scope of services rendered.

For example, working with the architect during design, the CM provides updated cost projections so that a client will know probable costs, which the project evolves. A general constractor, however, doesn't usually enter the scene until after the design is complete.

The CM decides who bids the job, picks up the request for invitation to bid, evaluates the bids, and awards work to the most reasonable bidder. The CM also prepares contracts and sends them out to the subcontractors.

The owner signs the contracts with each subcontractor, unlike a general constractor who signs these contracts. As a result, the subcontractors are under the CM's direction.

The CM may also be responsible for the safety of workers on the construction site.

12.2 Give the equivalents to the following words:

Apprentice, bid, carpenter, chimney, cornice, drain, expose, granolithic, joiner, lathing, mould, plumber, render, request, sheet.

12.3 Add the missing information from the text

A) ... is called tradesman or craftsman.

B) A fixer or a fixer mason or a builder mason is a mason who....

C) In the USA the term....

D) In some districts..., and slating and lay plaster and granolithic floors.

E) ....., including the insides of manholes.

12.4 Make up the dialogue between a plumber and a client

12.5 Read the text. Explain the meanings of the word PAINT

One day a painter, looking out of the window, saw an old country man going by and thought the man would make a good subject for a picture. So he sent his servant to tell the man that her master would like to paint him. The old man hesitated and asked what the painter would pay him. She said he would pay him a pound. The old man still hesitated. "Come on", she said. "It's an easy way to earn a pound". "Oh, I know that," he answered. "I was only wondering how I should get the paint off afterwards".

13 Building Materials

13.1 Read and translate the text

Some of the most important building materials are: timber, brick, stone, concrete, metal, plastics and glass.

Timber is provided by different kinds of trees. Timbers used for building purposes are divided into two groups called softwoods and hardwoods. Timber is at present not so much used in building construction, as in railway engineering, in mining and in the chemical industry where it provides a number of valuable materials.

However, timber is still employed as a building material in the form of boards. For the interior of buildings plywood and veneer serve a number of purposes.

A brick is best described as a "building unit". It may be made of clay by moulding and baking in kilns, of concrete, of mortar or of a composition of sawdust and other materials. In shape it is a rectangular.

There exists variety of bricks for different purposes: ordinary, hollow or porous, lightweight, multicolor bricks for decorative purposes, etc. Bricks are usually laid in place with the help of mortar.

The shape and convenient size of brick enables a man to grip it with an easy confidence and, because of this, brick building has been popular for many hundreds of years. The hand of the average man is large enough to take a brick and he is able to handle more than 500 bricks in an eight-hour working day.

It is necessary, therefore, for the "would be" bricklayer to practise handling a brick until he can control it with complete mastery and until he is able to place it into any desired position.

The brick may be securely handled by placing the hand over the surface of the upper part of a brick and by placing the thumb centrally down the face of the brick with the first joints of the fingers on the opposite face. It is better to protect the thumb and the fingers with leather pads, which also prevent the skin from rough bricks.

Sometimes natural stones such as marble, granite, basalt, limestone and sandstone are used for the construction of dams and foundations.

Marble, granite and sandstone are widely used for decorative purposes as well, especially with the public buildings.

Natural stone is used for foundations and for the construction of dams. The main varieties of building stone are basalt, granite, marble, sandstone and limestone.

Metals: Aluminium, principally in the form of various alloys, is highly valued for its durability and especially for its light weight, while brass is frequently used for decorative purposes in facing.

Steel finds its use in corrugated sheets for roofing, for girders, frames, etc. Various shapes are employed in construction.

Plastics are artificial materials used in construction work for a vast number of purposes. Nowadays plastics, which are artificial materials, can be applied to almost every branch of building, from the laying of foundation to the final coat of paint. Synthetic resins are the main raw material for plastics. Plastics have some good advantages as they are lighter than metals, not subject to corrosion, and they can be easier machined. Besides, they are inflammable, they can take any color and pattern, and

they are good electrical insulators. More over, they possess a high resistance to chemical action.

A lot of decorative plastics, now available, have brought about a revolution in interior and exterior design. But plastics are used now not only for decoration. These materials are sufficiently rigid to stand on their own without any support. They can be worked with ordinary builders' tools.

Laminate is a strong material manufactured from many layers of paper or textile impregnated with thermosetting resins. This sandwich is then pressed and subjected to heat. Laminate has been developed for both inside and outside use. It resists severe weather conditions for more than ten years without serious deformation. As a structural material it is recommended for exterior work. Being used for surfacing, laminate gives the tough surface.

Foamed glass is a high-porosity heat insulating material, available in block made of fine-ground glass and a frothing agent. Foamed glass is widely used in prefabricated house building, to ensure heat insulation of exterior wall panels, and in industrial construction.

Foamed glass has a high mechanical strength, is distinguished by moisture, vapour and gas impermeability. It is non-inflammable, offers resistance to frost, possesses a high sound adsorption, and it is easily sewn and nailed.

Structural foamed glass blocks designed to fill ceilings, and for making interior partitions in buildings and rooms, to ensure heat and sound insulation.

For insulation mineral wool or cinder wool is often resorted to.

13.2 Add the missing parts of the sentences from the text

A) ... for building purposes are divided into two groups called softwoods and hardwoods.

B) However, timber is still employed ...

C) .... ordinary, hollow or porous, lightweight, multicolor bricks for decorative purposes, etc.

D) ... they use natural stones such as marble, granite, basalt, limestone and sandstone.

E) .... while brass is frequently used for decorative purposes in facing.

F) These materials are sufficiently rigid to stand...

G) .... severe weather conditions for more than ten years without serious deformation.

H) ...to ensure heat insulation of exterior wall panels, and in industrial construction.

I) It is non-inflammable, offers resistance to frost, ...

13.3 Tell the group about any of the building materials you know better about. Add your own information (you can read supplementary texts if you want)

13.4 Discuss different building materials from the text with your partner finishing the following phrases:

A) What you need most of all is...

B) Another important thing is...

C) ... can make a real difference.

D) I think ... is pretty important too.

13.5 Read and learn the dialogue by heart

Customer: I would like to order a countryside house. Here is the project.

Foreman: Let's see. A two-storey house with a garage. Ten rooms and two staircases. What will the foundation be made of? Concrete?

C: Yes, ferro-concrete.

F.: And what about the walls?

C: I want red brick walls. The windows are large. By the way, the panes should be airtight. I want them to be double-glazing!

F.: We'll make them hermetic with putty. We put it in the grooves, and then fix the panes.

C: Excellent. The hinges and handles should be bronze.

F.: Ok. What type of roof would you like?

C.: I want the roof to be flat, with a small garden.

F.: Do you have an interior-designer?

C.: Yes, but the drafts aren't ready.

F.: What idea does he have?

C..- There will be a mantelpiece in the hall and the walls will be decorated with panels.

F: Plastic panels?

C: Oh, no. Panels must be made of wood.

F.: What wood do you prefer?

C.; I think oak is the best.

F.: How do you pay the construction?

C: I've got a mortgage for 25 years from the bank.

F.: So we'll make oak panels then.

Supplementary texts

Architecture: Its Forms and Functions

Architecture is the art or science of planning, building and structures. Without consideration of structural principles, materials, social and economic requirements a building cannot take form. But without aesthetical quality inherent in its form a building cannot be considered as a work of architecture1 as well. From the very beginning of construction in human history lots of architectural skills, systems and theories have been evolved for the construction of the buildings, which have housed nations and generations of people in any kind of their activity. Writings on architecture are almost as old as writing itself. Books on the theory of architecture, on the art of buildings, and on the aesthetical view of buildings exist in great number. The oldest book, which sets forth the principles, upon which buildings should be designed and which aim is to guide the architect, is the work of Markus Vitruvius Pollio written in the first century BC.

Architecture is an art. Its nowadays expression should be creative and consequently new. The heritage of the past cannot be ignored, but it must be expressed in modern terms. There exists an evident paradox in the coexistence of change and survival in every period of human civilisation. This paradox of change and repetition is clearly illustrated in any architectural style.

Architecture is also the style or manner of building in a particular country or period of history. There are widely known examples of Gothic architecture all round the globe. During many centuries mankind admires the architecture of ancient Greece or Roman Empire as well.

Nearly two thousand years ago the Roman architect Vitruvius listed three basic factors in architecture. They are convenience, strength and beauty. These three factors have been present and are always interrelated in the best constructions till the 21st century.

No true architect could think of any of them without almost automatically considering the other two as well. Thus, architectural design entails not only the necessity to study various solutions for convenience, structure, and appearance as three separate processes.

Architectural design also includes the necessity to keep in mind the constant interaction of these factors. It's impossible for an architect first plan a building from the point of view of convenience, and then make the design of a strong construction around his plan to shelter it.

Then, as a final touch, try to adjust and decorate the whole to make it pretty. Any design evolving from such kind of work will produce only a confused, incoherent, and unsatisfactory building. When speaking about any truly great building we cannot but say that every element in it has a triple implication or significance.

This triple nature of architectural design is one of the reasons why architecture is a difficult art. It needs some unique type of imagination as well as long years of training and experience to make a designer capable of getting requite in the light of these thee factors—use, construction, and aesthetic effect—simultaneously. The designer must have a good knowledge as of engineering so of building materials. This knowledge will enable him to create economically strong and practical construction. The designer, in addition, must possess the creative imagination, which will enable him to integrate the plan and the construction into the harmonious whole. The architect's feeling of satisfaction in achieving such integration is one of his/her (their) greatest rewards.

Answer the questions to the text

1 What is architecture?

2 What is the oldest book to set forth the principles of construction?

3 How should mankind deal with the heritage of the past?

4 What three basic factors in architecture were listed nearly two thousand years ago?

5 Why architecture is a difficult art?

6 What can we say about any truly great building?

7 What integration must an architect achieve?

The Community and Architecture

The forms to be taken by community must be decided before they are constructed. But long-term "master plans", we have learned, must not be too detailed. Someone must plan where streets are to run, parks are to be laid out, and industrial facilities are to be furnished. Someone must plan new housing and new public buildings, parks, and playgrounds. Surely architects are necessary for these goals. And yet, community plans need the contribution of experts in many fields. Modern city planning has become so complex, so enmeshed in static, and so controlled by financial interests that too often community plans appear that are lifeless and mechanical. In this field it is the architect's task to redress the balance, to realize that cities exist for people, that business and industry and science should serve the people and not enslave them.

During the last century hundreds of cities grew up throughout the world, and thousands of country towns expanded into great industrial or commercial centers. In the sense that all the buildings in Chicago or Los Angeles were constructed in recent times, they are modern communities. But in these new cities one searches in vain for any common principle of design that would distinguish them from earlier towns.

If, however, one examines the contemporary city more closely, one comes upon forms that had no counterpart in any earlier civilization. The country villa and the suburb are time-honored forms; but only with the development of rapid transportation, however, did it become possible to disperse the population of a great center over an area at least ten times as great as the biggest cities of the past. The skyscraper has permitted the assembling of business offices and light industry in concentrated hives, served by vertical transportation; but the erection of such buildings on streets designed for four-story buildings and horse drawn transportation has everywhere produced chaos.

Nowhere have the new forces in urbanism been organized so as to create both a functional and an aesthetic unity. One cannot derive an archetype for the modern city from any existing example. Neither can one create it merely by uncritically accepting all technological devices as essential ingredients. There is room, then, for an effort to define the modern community in ideal terms, on the basis of existing facts and tendencies. These facts and tendencies are not confined to the provinces of engineering and architecture; they issue from industry, from education, from medicine and psychology, and indeed from politics.

Answer the question:

1 Who must plan new housing and public buildings?

2 What forms are time-honoured?

3 Are there any forms in the modern cities that have counterparts in earlier civilizations?

Government Architecture

Architects and persons specially interested in the subject have known for many years that the Government architecture of the United States was in a most unsatisfactory condition. Various attempts have been made by the profession to improve its condition, but these have failed, mainly by reason of the apathy of the public, which was reflected by the representatives of the public in Congress. The avidity with which members of congress sought for appropriations for public buildings in their respective districts

has not been attendant with any solicitude that the buildings, when secured, should do credit to the towns in which they were built or to the towns in which they were built or to the Government. The office of the Supervising Architect, in Washington, has been the source of the designs for all the Government buildings, as well as the place of supervision, which its name imports.

This fact is admitted to be the main cause of the architectural defects in the public buildings and the explanation why these do not embody the best results of American architecture or do justice to the attainments of the architectural profession. Even if the Supervising Architect were at the head of his profession as a designer, it is not possible, under the conditions which now prevail, that he should produce works as creditable as are produces in private practice, or that they should be built as economically. He has too many other things to do. The proper work of his office, that of supervision, is enough to tax the time and the energies of any man. As a matter of fact, the design of new buildings is relegated to subordinates in his office, who are perforce intrusted with projects so important as to require the best efforts of the leaders in the profession.

A few weeks ago a delegation, including the President, Vice President, and Secretary of the American Institute of Architects, and some of the leading architects of the country, including an ex-Supervising Architect of the Treasury, had a hearing before the House Committee on Public Buildings and Grounds, in which they pointed out the defects of the present system and indicated a more excellent way to obtain the designs and to carry on the construction of public buildings. This hearing has borne fruit in a bill reported to make available for the purposes of the Government the architectural talent of the country. The bill authorizes the Secretary of the Treasury to select architects to prepare the designs and to superintend the erection of public buildings, by competitions in each of which not less than five architects shall take part, and to pay for the cost of the designs out of the appropriations for the buildings. There is no question that this method, if faithfully and intelligently followed, will result in a distinct improvement in the Government architecture. This method of limited competitions is inferior only to the method of direct selection, which seems to be regarded by members of Congress as unavailable. As Mr. Kendall, the President of the institute, it is the method followed, with excellent results, in obtaining a design for the new State House in Rhode Island, while the method of direct selection under professional advice has been followed in the architecture of the Columbian Exposition with results that will assuredly be highly creditable to the country and greatly enhance the reputation of American architecture in Europe.

There need be no fear that the new method will be more expensive than the old, even including the cost of the competitions, which would be saved by a direct selection of architects. At the hearing before the committee it was shown that the Government buildings cost from half as much again to twice as much per cubic foot as such great and ornate edifices as the Chicago Auditorium and the Boston Public Library, without including in the cost of the former the expenses of the Supervising Architects' office, while in the later cases the architect's fees are reckoned as part of the cost of the building. Under the proposed system the Government will undoubtedly get more for its money, in architecture, in good and substantial building, and in comfort and convenience, than it has been able to get heretofore. The whole business of the Supervising Architect's office, excepting only design and local supervision, and including all the financial part, is left to that office. The matter of design is left to it also in all cases in which the new method may prove inapplicable. The bill is permissive and not mandatory, and simply authorized the Secretary of the Treasury to obtain architects by competition, when that course seems to him advisable. It is inconceivable that any Secretary of the Treasury who is an enlightened man should not take advantage of the authorization whenever an important public building is to be erected. Under an intelligent administration of this system it may be expected that an employment as Government architect may become as much a professional prize and as sure a proof of professional eminence in this country as it now is in France. Decidedly the bill reported to the House ought to become law.

Ice hotels

For more than two centuries, ice palaces were popular in Russia and then later in North America, but the fashion was short-lived. Now ice hotels are catching on. Gabrielle Walker reports from Sweden on this unusual but fast-growing tourist destination.

Every winter, for the past two decades, the Swedish village of Jukkasjarvi, 200 kilometers north of the Arctic Circle, has been the site of a hotel made entirely of snow and ice. The first ice hotel was built in 1989 to house an exhibition of paintings and sculptures. A few hardy souls decided to spend the night inside the ice construction and from there the idea took off. Now there are more than 6,000 overnight guests in a season, and many more day visitors. Some come to get married in the ice chapel. Others come for the dare, or out of pure curiosity to witness the closest living relative of the old ice palaces.

So how do you build a 37-room hotel to last 5 months from such an unpromising raw material? The first rule of snow building is that there are no vertical walls. Instead, the hotel is made up of interconnecting arched hallways, the arched not quite semicircular. The white, sloping walls of the entrance hall are reassuringly solid, and the ceiling is propped up by cylindrical columns of ice, some flecked with bubbles, some perfectly clear. The first impression is one of dazzling whiteness. Round the corner stretches a long hallway, with ice sculptures set into alcoves along the walls.

The arches are made from a combination of snow and ice which the designer call snice. They start in November at the beginning of winter, using snow- making machines. First they line up a row of metal frames and coat them with a mix of snow and water. In temperatures that can drop to -30°C or less the snice takes only a couple of days to become rock solid. The frames can then be slid out and moved on to make the next part of the hotel. The ice for the columns – and for the window and sculptures for which the hotel is famous –comes from the Torne river, where runs alongside the hotel. Because there are no hydroelectric plants or factories nearby to pollute the water, the ice it produces is as clear as glass.

One major challenge is to produce light without heat, which melts the ice, so the chandelier in the bar is lit from a projector on the roof, which feeds into a bundle of fibre-optic cables. Below the sculptures are low wattage lamps and the bar has a gentle neon strip light. The owner, Arne Bergh, explains that they avoid many colours as it makes the ice look like candy: "We want it to look like ice". To power the lighting, the hotel walls contain building of ice and water."

Do the following statements agree with claims of the writer of the passage? Write TRUE, FALSE or NOT GIVEN

1 The original ice hotel was built to display art work.
2 Most people who visit the hotel spend the night there.
3 From the inside, the walls have a fragile appearance.
4 The ice sculptures are difficult to carve.
5 The walls are built around the moveable frames.
6 The river adjacent to the hotel is unpolluted.
7 The fiber-optic cables have to be specially produced.

To the History of Construction

With the introduction of the railways and steam machinery, transportation and manufacturing costs were considerably reduced and

concrete came to be more widely used, but it was still very much a neglected material. Therefore, good concrete was scarce and a great deal of poor concrete was used.

The big break-through was the discovery of Portland cement by Joseph Aspdin in 1824, a worker in an English town.

When he was working an idea came to him as to how to make his work better. He started his experiments. After some time he obtained a powder. When it was mixed with water and allowed to stand it "sets" forming a hard substance. This substance was so much like the building stone from Portland that the powder was named Portland cement. As years passed different materials were found in many countries from which Portland cement could be made.

Portland cement was first used on a large scale in the construction of the Thames tunnel in 1828.

As early as 1830 the first idea of reinforced concrete was mentioned in a publication, which suggested that a lattice of iron rods be embeded in concrete to from a roof.

Patents were taken out for all sorts of systems in all countries.

The development of reinforced concrete really got under way in the 1850's and 60's.

Lambort, a French contractor, built a concrete boat for the Paris International Exhibition of 1855, with 2 inches sides reinforced with a skeleton of iron rods.

W. Wilkinson, who patented a method of constructing a concrete floor in 1854, is considered by many to be the inventor of reinforced concrete as well.

But many people say that a Frenchman, J. Monier, who took out a patent in 1867 for the construction of plant tubs, tanks, etc., made of concrete reinforced with a mesh of rods or wires, should be credited with the invention. Certainly Monier did a great deal to develop the use of reinforced concrete and his name came to be so closely linked with reinforced concrete that reinforced concrete was known as the Monier System.

Wilkinson, however, certainly appears to have been the first. His patent covered for concrete floor slabs reinforced with a network of flat iron rods placed on edge. One of his main claims was the good fire resistance of the floor. He appears to have understood the principles of reinforced concrete, for he stated that the reinforcement was to be placed in the concrete to take the tension.

A number of buildings were erected, using Wilkinson's system. He also described method for the construction of pipes, reservoirs, and walls of concrete reinforced with metal sheets, bars and chains.

Freyssinet is known for his work in prestressed concrete for which he had his first ideas before First World War. With the improved materials and the new knowledge available, Freyssinet realised the advantage to be obtained from prestressing, and he used his system in prestressed works.

From now on structures became bigger, better and more exciting, and concrete steadily strengthened its position as a building material. Reinforced concrete was recognized as the best material for all types of structures.

The post-war era has given the biggest boost to concrete, both reinforced and prestressed. After the war steel was short in Europe and many architects had to use either reinforced or prestressed concrete in their structures in order to economize in steel.

Architects were perhaps a little surprised to discover that in many cases reinforced concrete structures, apart from using the minimum of steel, were also cheaper than other forms of construction, and could be erected as quickly. They also discovered that they had more freedom for planning than they had ever before, and a larger number of different solutions to each structural problem were available.

Beams could be eliminated, floor spans could be increased, and shells were available for roofing large areas.

Another big factor, which encouraged the use of concrete, was the introduction of fire regulations, which recognized the superiority of concrete over other structural materials in its fire resistance properties.

Concrete

Concrete is perhaps the most widely spread building material used nowadays. Concrete is an artificial stone, made by thoroughly mixing such natural ingredients or aggregates as cement, sand and gravel or broken stone together with sufficient water to produce a mixture of the proper consistency. It has many valuable properties.

It sets under water, can be poured into moulds so as to get almost any desirable form, and together with steel in reinforced concrete it has very high strength, and also resists fire. Prestressed concrete is most widely used at present while prefabricated blocks are employed on vast scale for skeleton structures.

Aggregates for concrete

By the simple definition from the dictionary "aggregates are the materials, such as sand and small stones, that are mixed with cement to form concrete". In other words aggregates (or cushioning materials) can be defined as a mass of practically inert mineral materials, which, when surrounded and bonded together by an active binder, form the rock. This rock is denoted by the general term concrete.

Aggregates have three principal functions in the concrete: they provide a relatively cheap filler for the concreting material, or binder; they provide a mass of particles which are suitable for resisting the action of applied loads, of abrasion, of percolation of moisture through the mass, and of climate factors; they reduce volume changes resulting from the action of the setting and hardening of the concrete mass.

All aggregates, both natural and artificial, which have sufficient strength and resistance to weathering, and which do not contain harmful impurities may be used for making concrete.

As aggregates such natural materials as sand, pebbles, broken stone, broken brick, gravel, slag, cinder, pumice and others can be used.

Prestressed concrete is not a new material. Its successful use has been developed rapidly during the last two decades, chiefly because steel of a more suitable character has been produced. Concrete is strong in compression but weak when used for tensile stresses.

If, therefore, we consider a beam made of plain concrete, and spanning a certain distance, it will at once be realized that the beam's own weight will cause the beam to "sag" or bend. This sagging at once puts the lower edge of the beam in tension, and if the cross-sectional area is small, causes it to break, especially if the span is relatively large.

If, on the other hand', we use a beam of similar cross-section, but incorporate steel bars in the lower portion, the steel will resist the tensile stress derived from the sag of the beam, and thus assist in preventing it from breaking.

In prestressed concrete steel is not used as reinforcement, but as a means of producing a suitable compressive stress in the concrete.

Therefore any beam (or member) made of prestressed concrete is • permanently under compression, and is consequently devoid of crack under normal loading, or so long as the "elastic limit" is not exceeded.

Prestressed concrete is not only used for beams but is now employed extensively for columns, pipes, and cylindrical water towers, storage tanks, etc.

Asbestos

Asbestos has been known and used as a textile since the earliest times. The first written evidence of asbestos was recorded by Pliny in the first century A.D.

It is told that one of the Emperors of Rome delighted guests by throwing a tablecloth made of asbestos into fire and then removing it unchanged from the flame. A few centuries later Marco Polo told his friends in Italy about a substance he observed in Siberia. He told that it could be woven into attractive textiles, which did not burn even in direct flame.

Asbestos is one of the strangest of all the naturally occurring fibers. It is a rock, which has been subjected to unusual treatment during its formation. Asbestos is the only mineral substance used as a textile fiber in the form it is obtained from natural sources. There are many varieties of asbestos rocks but only chrysotile is widely used for textile products. Chrysotile is mined in many countries of the world. The soft, long, white fibers of this mineral can be spun into yarn by the usual processes. Pure asbestos being very difficult to spin, a proportion of cotton fiber is usually added to help to bind the asbestos fibers together. The strangest characteristic of asbestos fibers is their resistance to heat and burning. This property determines the ways in which they are used.

Early uses for asbestos included such articles as handkerchiefs and table coverings. The Chinese used asbestos to make false sleeves, which could be cleaned by putting them in the fire. All the dirt was burned off, leaving the asbestos clean. We know commercial development of the fiber to have started in the 19th century. Asbestos was used in flameproof clothing of many kinds, for laboratory, industrial and military purposes

Fabrics made of asbestos have good strength. Today the main applications are those in which non-inflammability is essential such as conveyor belting for hot materials, industrial packings, fireproof clothing, etc. Asbestos is sometimes used with glass fiber in making decorative fabrics for curtains used in hospitals, theatres and other buildings where the public assembles. Some grades of asbestos are used for electrical windings and insulation.

Cement

White Portland Cement. The chemical composition and characteristics of white Portland cement are similar to those of ordinary Portland cement except that the latter is of a grey colour. The colour of

white cement is due to the raw materials used and special precautions taken in its production. The materials are pure limestone and china (white) clay, the iron oxide content being less than 1 per cent.

White cement is more expensive than ordinary cement. It is used in places where, for ornamental purpose, the white colour is desirable.

Portland Blast-Furnace Cement. This is a mixture of ordinary Portland cement and blast-furnace slag. The slag is mixed with ordinary cement clinker and passed to a ball mill for thorough incorporation and fine grinding. The proportion of slag must not exceed 65 per cent, and that of Portland cement clinker not less than 35 per cent.

High Alumina Cement. It is dark brown in colour. It contains about 40 per cent each of lime and alumina with about 15 per cent of iron oxides. This cement sets at about the same rate as Portland cement but gains strength very rapidly. Owing to the chemical activity after hardening for the first 24 hrs, it requires very wet curing conditions. This cement is several times more costly than ordinary Portland Cement.

Tufa Cement. Tufa Cement is formed by grinding pulverized tufa with an approximately equal volume of Portland cement. Tufa is a rock of volcanic origin, consisting of 65 to 75 per cent silica and 10 to 15 per cent alumina, with some of the silica soluble.

Sedimentary Rock. This division comprises those stones which are chiefly employed for building purposes. Most of these rocks are formed of fragments of igneous rocks, which have been deposited by water in layers or strata. As successive layers were formed these sediments became hardened and consolidated by great pressure and were cemented together by sandy or clayey paste or by a chemical substance (such as carbonate of lime) conveyed by the percolating water. Other rocks of this division are formed from remains of marine organism (shellfish, etc) and chemically by precipitation. The principal sedimentary rock are sandstones and limestones.

Sandstones. These consist of grains of quartz (sand or silica) held together by a cement or matrix. Sandstones are classified according to the nature of the binding material thus siliceous sandstones, calcareous sandstones and argillaceous sandstones. Sandstones form one of the most valuable materials. The durability of sandstones depends very/largely upon the cementing material. Siliceous sandstones are therefore generally considered to be the most durable of the sedimentary rocks, as the binding material of silica is highly resistant to acid attack. The excellent state of preservation of many ancient, buildings 'built of this stone is evidence of this. City buildings constructed of sandstone often assume a drab appearance owing to the dark colour.

Answer key

1.3 1- F, 2 -T, 3 -T, 4- F, 5- T, 6 -F.

1.4 1- b, 2 -c, 3- b, 4- c, 5 -a, 6- b, 7 -c.

2.1 a -1979, b -every year, c- $100,000 (US) and a bronze medallion, d- the Nobel Prize, e -previous laureates of the prize, f -welcoming remarks from a dignitary of the host country; comments from the jury chairman; the presentation of the prize by Thomas Pritzker; and an acceptance speech from the Laureate, g -"firmness, commodity and delight,"h -nationality, race, creed, ideology, i- in the spring.

2.2 a -F, b- T, c -T, d -F, e –F

2.3 establish, grant, homage, pronounced, cognizant, honor, inspire, reinforce.

3.1 1 -b, 2 -d, 3 -a, 4- e, 5 -f, 6- c

3.2 a- England and France, b -Cesar Pelli, c- Europe, Asia, Australia, South America, d -4, e -provide electricity and water, f -Pyramid of the sun, The Petronas Towers

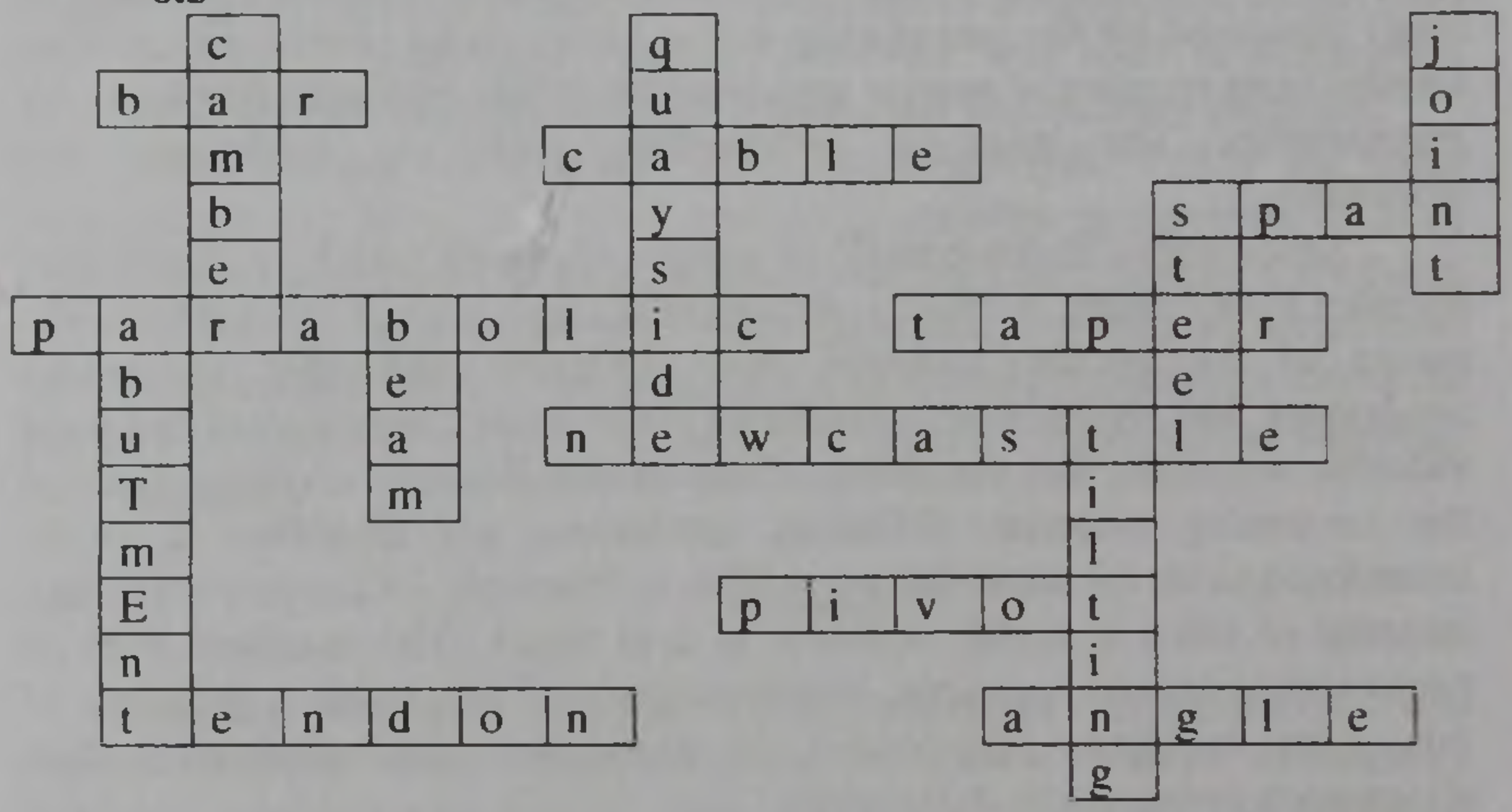
3.3 a- attraction, b- feature, c- bridge, d- underground, e- performance, f- magnificent, g- temple, h- create, i- giant, j-flat.

4.3 1-made, 2 –debut, 3- antiquity, 4- rediscovered, 5- by, 6- pretending, 7- designated, 8- caravan-city, 9- half-carved.

4.4 a- Petra, b- trade routes , c- gorge, d- rock-face.

5.2 a- 30 St.Mary Axe, gherkin, b- cigar, a rocket, a bullet, a lipstick, a Zeppelin airship, a lava lamp, a bandaged finger, pine cone, pineapple, c- Most Londoners appreciate the novelty and sophistication of the building.

6.3



7.2 a- From the beginning , b- Let it rain , c- A bit about the Biomes , d-soil, e-climate, f- Plants, g- Animals.

8.3 1-a, 2- f, 3- b, 4- e,5- g, 6- c,7- h, 8-i.

8.4 1- F, 2- F, 3- T, 4-T, 5-NG.

9.3 a- adopted, b-crystalline, c- triumphal, d-apolitical, e- notorious, f- transparent, g- self-sufficient, h- ghastly, i-ethereal.

10.3 a- T, b- F, c- F, d- NG, e- NG.

Әдебиеттер

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Мазмұны

А. С. Сарсенбаева

АҒЫЛШЫН ТІЛІ

Оқу - әдестемелік құралы

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